

European Innovation
Scoreboard **2024**
Country Profile
Türkiye

European Innovation Scoreboard 2024 – Country profile Türkiye

European Commission

Directorate-General for Research and Innovation

Directorate G – Common Policy Centre

Unit G.1 – Common R&I Strategy & Foresight Service

Contact Alexandr Hobza, Chief Economist and Head of Unit G.1

Athina Karvounaraki

Alexis Stevenson

Email RTD-STATISTICS@ec.europa.eu

RTD-PUBLICATIONS@ec.europa.eu

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

Directorate A – Strategy and Economic Analysis

Unit A.1 – Chief Economist

Contact Román Arjona, Chief Economist and Head of Unit A.1

Xosé-Luís Varela-Irimia

Email GROW-A1@ec.europa.eu

European Commission

B-1049 Brussels

Manuscript completed in July 2024

This document has been prepared for the European Commission, however it reflects the views only of the authors, and the European Commission shall not be liable for any consequence stemming from the reuse.

© European Union, 2024



The Commission's reuse policy is implemented by Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39, ELI: <http://data.europa.eu/eli/dec/2011/833/oj>). Unless otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed, provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightholders.

European Innovation Scoreboard 2024 Country profile Türkiye

The report was prepared by

EFIS Centre, Technopolis Group and OldContinent

for the European Commission, Directorate-General for Research and Innovation under the Specific
Contract LC-03213706
implementing framework contract European Innovation Scoreboard (EIS) and the Regional Innovation
Scoreboard (RIS) 2024-2027 N° FW-00154786

**Emerging Innovator** ●Summary innovation index (relative to EU in 2017): **56.9**Rank: **31**

Change vs 2023: ▲ 5.7 Change vs 2017: ▲ 6.1

Türkiye is an Emerging Innovator with performance at 51.7% of the EU average in 2024. Performance is above the average of the Emerging Innovators (48%). Performance is increasing less than the EU (+10%).

Indicator	Performance relative to the EU in 2024	Performance change 2017-2024	Performance change 2023-2024
SUMMARY INNOVATION INDEX	51.7	6.1	5.7
Human resources	60.3	18.2	9.6
New doctorate graduates	34.5	23.2	11.6
Population with tertiary education	92.4	18.6	9.0
Population involved in lifelong learning	54.2	9.1	7.1
Attractive research systems	49.3	23.8	8.0
International scientific co-publications	14.3	14.8	2.7
Scientific publications among the top 10% most cited	76.1	29.3	5.4
Foreign doctorate students as a % of all doctorate students	39.5	20.4	18.9
Digitalisation	38.6	18.1	7.7
Broadband penetration	46.1	33.2	12.4
Individuals with above basic overall digital skills	28.3	3.3	3.3
Finance and support	62.4	31.2	3.3
R&D expenditure in the public sector	63.9	3.2	-5.0
Venture capital expenditures	11.9	9.0	1.0
Direct and indirect government support of business R&D	124.0	97.7	17.9
Firm investments	48.1	4.9	-5.0
R&D expenditure in the business sector	53.5	24.8	-3.8
Non-R&D innovation expenditures	51.1	-10.8	-10.8
Innovation expenditures per person employed	39.4	-0.7	-0.7
Use of information technologies	33.1	3.6	15.9
Enterprises providing ICT training	64.4	4.4	32.4
Employed ICT specialists	2.9	3.2	0.0
Innovators	72.6	-61.4	10.8
SMEs introducing product innovations	67.7	-66.6	0.7
SMEs introducing business process innovations	76.5	-56.6	20.3
Linkages	77.0	-21.1	-3.3
Innovative SMEs collaborating with others	73.2	-13.3	36.2
Public-private co-publications	13.5	8.5	0.3
Job-to-job mobility of HRST	106.2	-41.2	-38.2
Intellectual assets	30.7	6.4	1.6
PCT patent applications	57.1	13.5	3.6
Trademark applications	18.9	6.9	1.8
Design applications	1.8	-3.2	-0.8
Employment impacts	30.4	-19.4	7.1
Employment in knowledge-intensive activities	9.0	4.8	4.8
Employment in innovative enterprises	48.4	-41.8	9.0
Sales impacts	68.0	14.6	13.1
Exports of medium and high technology products	56.1	-3.3	0.0
Knowledge-intensive services exports	44.4	10.6	2.2
Sales of new-to-market and new-to-firm innovations	124.1	48.8	48.8
Environmental sustainability	43.3	8.9	1.6
Resource productivity	70.3	25.0	11.8
Air emissions by fine particulates	34.3	12.4	7.3
Environment-related technologies	31.1	-8.8	-14.7

Relative strengths

- Sales of new-to-market and new-to-firm innovations
- Direct and indirect government support of business R&D
- Job-to-job mobility of HRST

Relative weaknesses

- Design applications
- Employed ICT specialists
- Employment in knowledge-intensive activities

Strong increases since 2017

- Direct and indirect government support of business R&D
- Sales of new-to-market and new-to-firm innovations
- Broadband penetration

Strong decreases since 2017

- SMEs introducing product innovations
- SMEs introducing business process innovations
- Employment in innovative enterprises

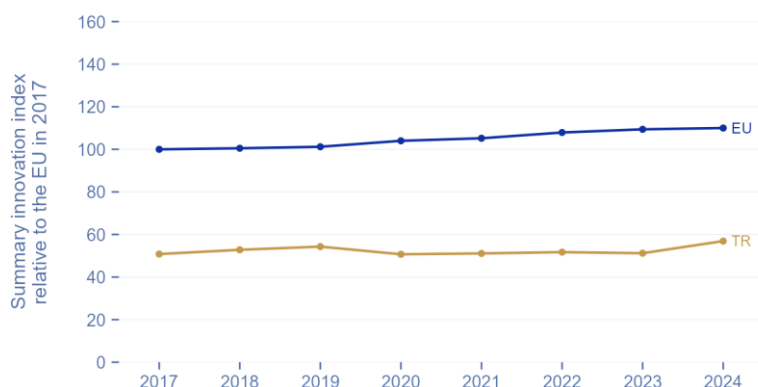
Strong increases since 2023

- Sales of new-to-market and new-to-firm innovations
- Innovative SMEs collaborating with others
- Enterprises providing ICT training

Strong decreases since 2023

- Job-to-job mobility of HRST
- Environment-related technologies
- Non-R&D innovation expenditures

Footnote: The first data column shows scores relative to the EU in 2024, with colour codes indicating performance levels. The subsequent columns show performance changes over time, with scores relative to the EU in 2017, coloured in purple for positive change and red for negative change. As reference years differ between the first column (2024) and the last two columns (2017), scores cannot be directly compared or subtracted across these columns.



Summary innovation index

The line chart shows the evolution of the innovation performance of Türkiye over time, relative to the performance of the EU in 2017.

Footnote: All performance scores (SII and dimensions below) are relative to that of the EU in 2017.

Framework conditions

Türkiye faces several challenges in its human resources, research system and digitalisation that affect the overall performance of its R&I system. It lags considerably in international scientific co-publications (14.3% of the EU average in 2024) and struggles to attract foreign doctorate students (39.5% of the EU average in 2024). Relative weaknesses are also observed in Türkiye's quality of scientific output, with a performance in the top 10% of most cited publications worldwide, below the EU average (76.1% of the EU average in 2024). However, Türkiye's share of the tertiary educated population is around the EU average, with 41.7% of the total population. The proportion of new graduates in science, technology, engineering, and mathematics (STEM) is nevertheless notably below the EU average (34.5% of the EU average in 2024). Broadband penetration also poses a barrier to innovation, falling below the EU with 36.2% as a share of companies with the fastest fixed internet connection (at least 100 Mb/s). This is coupled with challenges in the country's access to a workforce with digital skills beyond basic proficiency (28.3% of the EU average in 2024).

However, Türkiye has recorded positive growth across all dimensions over the period 2017-2024, including human resources, research systems, and digitalisation. The most notable improvements are seen in broadband penetration, which has increased by 33.2%-points. This is followed by a 29.3%-point increase in the share of publications among the top 10% most cited worldwide and a 23.2%-point increase in the number of new STEM graduates.

Human resources



Attractive research systems



Digitalisation



Investments

In Türkiye, public and business R&D expenditures are considerably lower than in the EU. R&D expenditure in the public sector including government and higher education stands at 0.5% of GDP, and R&D expenditure in the business sector at 0.8% of GDP. The very low level of venture capital investment in Türkiye also suggests limited support for entrepreneurial ventures and startups. Non-R&D innovation expenditures are equally lower than the EU average. While R&D spending remains low, it has grown by 3.2%-points in the public sector and more notably by 24.8%-points in the business sector over the period 2017-2024.

Despite these challenges, Türkiye's higher direct government funding and tax support for business R&D, which is above the EU average (124.0% of the EU average in 2024), indicates a proactive approach to encouraging private sector innovation. It also shows impressive growth of 97.7%-points since 2017.

Another relative weakness is the low share of ICT specialists. The performance in terms of the number of enterprises providing ICT training is also lower than the EU average, highlighting room for improvement in Türkiye's digital skills development.

Finance and support**Firm investments****Use of information technologies****Innovation activities**

Türkiye's performance regarding SMEs introducing product innovations (67.7% of the EU average in 2024) and business process innovations (76.5% of the EU average in 2024) is below the EU average. According to the OECD country report (2023) there are indications that technological upgrades to production have slowed. Additionally, the low rate of innovative SMEs collaborating with others and low public-private co-publications per million population indicate a significant gap in research collaboration between the public sector and private enterprises. Regarding public-private co-publications, the difference between Türkiye and the EU average is quite significant, with 13.5% of the EU average in 2024. Similarly, Türkiye's performance in intellectual property indicators such as PCT patent applications, trademarks, and design applications per billion GDP is considerably lower than the EU average. In contrast, Türkiye surpasses the EU average in the job-to-job mobility of Human Resources in Science and Technology, which, however, has been experiencing strong declines since 2017 with 41.2% points.

A key driver for research and innovation advancements is the 2019-2023 Strategic Plan prepared by the Scientific and Technological Research Council of Türkiye TÜBİTAK. The plan focuses on ensuring technology-focused product and service development with relevant programs.

Innovators**Linkages****Intellectual assets****Impacts**

The employment level in knowledge-intensive activities in Türkiye is significantly lower compared to the EU average (9.0% of the EU average in 2024) and has been recording a slight increase of 4.8%-points from 2017 to 2024. Similarly, employment in innovative enterprises is also lower (48.4% of the EU average in 2024) and has been decreasing by 41.8%-points since 2017. This indicates increasingly fewer job opportunities in sectors that drive innovation.

In terms of exports, Türkiye trails behind the EU in both medium and high technology product exports and knowledge-intensive services exports. According to the OECD (2023), Turkish exports are the least technology-intensive among OECD countries and the technology content of exports has not improved significantly over the past decade.

Despite these challenges, Türkiye demonstrates strengths in sales of new-to-market and new-to-enterprise innovations as a percentage of turnover which are higher in Türkiye compared to the EU average.

The industry's resource productivity and air emissions by fine particulate matter (PM2.5) indicate areas that need attention but that have also been improving, especially in terms of resource productivity, which has increased by 25.0%-points since 2017. Moreover, the development of environment-related technologies is considerably lower in Türkiye compared to the EU average and has been declining since 2017.

Employment impacts



Sales impacts



Environmental sustainability



Structural differences

Performance and structure of the economy

Türkiye is a fast-growing economy that, according to the OECD Economic Survey (2023), grew at an average annual rate of 6% between 2000 and 2021. In terms of employment distribution, Türkiye has a higher share of employment in manufacturing (19.9%) compared to the EU (15.8%) although less focused in high and medium high-tech sectors, with only 20.4% compared to the EU's 37.9% of total employment. Similarly, the employment share in services is slightly lower in Türkiye (33.9%) than in the EU (39.8%).

Business and entrepreneurship

Türkiye exhibits a higher rate of enterprise births at 2.8%, significantly surpassing the EU's 0.8%. Total Entrepreneurial Activity (TEA) in Türkiye is also higher at 15.7%, compared to 6.8% in the EU. On the other hand, Foreign Direct Investment (FDI) net inflows as a percentage of GDP are lower in Türkiye (1.4%) compared to the EU (1.9%). Additionally, Türkiye's top R&D spending enterprises are nearly negligible at 0.2%, compared to the EU's 8.4%. Lastly, buyer sophistication, is almost identical between Türkiye (3.5) and the EU (3.6).

Innovation profiles

The proportion of in-house product innovators with market novelties is relatively close, with Türkiye at 11.3% and the EU at 11.7%. Differences in innovation profiles are more notable for in-house product innovators without market novelties, with Türkiye at 7.6%, compared to the EU's 13.7% and in in-house business process innovators with Türkiye at 11.1% versus the EU's 17.6%. Also in Türkiye the percentage of innovators that do not develop innovations themselves (0.9%) is low compared to the EU (6.1%), which suggests that Turkish firms are more inclined to pursue innovation internally.

Türkiye also shows a higher proportion of innovation-active non-innovators at 7.4% compared to the EU's 4.2% which means a higher percentage of enterprises that did not introduce any innovation but that either had ongoing or abandoned innovation activities.

Türkiye has a higher percentage of non-innovators with the potential to innovate (22.6% versus the EU's 17.8%), which suggests slightly higher capacity for future innovation growth. However, the high percentage of non-innovators without a disposition to innovate (39.3% in Türkiye versus 30.6% in the EU) indicates relatively higher resistance by enterprises in applying new technologies or processes.

Governance and policy framework

The Corruption Perceptions Index and Rule of Law highlight significant challenges for Türkiye. The OECD Economic Survey (2023) notes that the perception of corruption is high and has deteriorated in recent years, emphasising the need for an anti-corruption strategy and the establishment of a permanent and independent anti-corruption body.

In terms of basic-school entrepreneurial education and training, Türkiye scores 2.1 and the EU 2.6 on a scale of 1 to 5, suggesting there is room for improvement in integrating entrepreneurial education within the basic school curriculum.

Government procurement of advanced technology products shows a slight advantage for Türkiye, with a score of 3.5 compared to the EU's 3.4. This indicates that Türkiye is somewhat proactive in leveraging government procurement to stimulate demand for advanced technologies, potentially providing a market for innovative firms.

Climate change

Türkiye's greenhouse gas emissions intensity of energy consumption is slightly higher at 88.8 compared to the EU's 82.8. Türkiye's primary energy supply relies on fossil fuels which are significant sources of greenhouse gas emissions.

Demography

Türkiye's population size is approximately 84.5 million. Its average annual population growth rate is 1%, significantly higher than the EU's 0.3%. Population density in both Türkiye and the EU is nearly identical, at approximately 109 people per square kilometre.

Structural indicators

The table below presents some structural differences between Türkiye and the EU.

	TR	EU
Performance and structure of the economy		
GDP per capita	67	100
Employment share Manufacturing	19.9	15.8
Employment share High and Medium high-tech	20.4	37.9
Employment share Services	33.9	39.8
Employment share Knowledge-intensive services	19.1	28.6
Turnover share SMEs		12.6
Turnover share large enterprises		49.6
Business and entrepreneurship		
Enterprise births	2.8	0.8
Total Entrepreneurial Activity	15.7	6.8
FDI net inflows	1.4	1.9
Top R&D spending enterprises	0.2	8.4
Buyer sophistication	3.5	3.6
Innovation profiles		
In-house product innovators with market novelties	11.3	11.7
In-house product innovators without market novelties	7.6	13.7
In-house business process innovators	11.1	17.6
Innovators that do not develop innovations themselves	0.9	6.1
Innovation active non-innovators	7.4	4.2
Non-innovators with potential to innovate	22.6	17.8
Non-innovators without disposition to innovate	39.3	30.6
Governance and policy frameworks		
Corruption Perceptions Index	36	64
Basic-school entrepreneurial education and training	2.1	2.6
Government procurement of advanced technology products	3.5	3.4
Rule of law	-0.4	1

	TR	EU
Climate change		
Greenhouse gas emissions intensity of energy consumption	88.8	82.8
Demography		
Population size (in millions)	84.5	447
Average annual population growth (2021-2023 average)	1	0.3
Population density	109.1	109

References

The country's relative strengths and weaknesses for each indicator, compared to other EU Member States and neighbouring countries, can be found in [Annex B](#).

OECD, OECD Economic Surveys TÜRKİYE, 2023, accessed July 4 2024, <https://www.oecd-ilibrary.org>

Tübitak, 2019-2023 Strategic plan, accessed July 4 2024, https://tubitak.gov.tr/sites/default/files/2023-09/tubitak_2019-2023_stratejik_plani.pdf

This report provides the Country profile from the 2024 European Innovation Scoreboard for Türkiye

Studies and reports